Appointment

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Start: 3/6/2018 5:00:00 PM
End: 3/6/2018 6:00:00 PM
Show Time As: Tentative

Recurrence: (none)

The SRA Dose Response Specialty Group is very pleased to announce:
Webinar Tuesday March 6th , 2018 Noon EST

Adobe Connect: https://epawebconferencing.acms.com/drsg/

Ex. 6 Personal Privacy (PP)

Machine Learning in Dose-Response Assessment: Translating Science to Decisions

Presented by: Dr Jacqueline MacDonald Gibson

Abstract:

Regulatory risk assessment requires dose-response models that accurately link exposure to toxicants to the probability of adverse health outcomes. In current U.S. practice for regulating contaminants in drinking water, dose-response models are binary: they assume a threshold (the reference dose) above which risk is presumed present and below which it is presumed absent. This approach does not allow for the computation of a quantitative risk measure that can be used in comparing health benefits of programs to reduce toxicant exposure. This webinar will present an alternative dose-response assessment approach based on Bayesian belief networks. The approach will be demonstrated with a dose-response model of diabetes risk from arsenic in drinking water. The model was machine-learned from a data set of 1,050 individuals from an arsenic-endemic region of Chihuahua, Mexico. The model integrates arsenic exposure data with

biomarkers of arsenic metabolism and demographic characteristics to quantify the probability of diabetes for different exposure levels and population subgroups. The predictive ability of the Bayesian network model will be compared to that of a reference dose model and of a model estimated with Benchmark Dose Software. Implications for policymaking will be discussed.

Dr. Jacqueline MacDonald Gibson is Associate Professor in the Department of Environmental Sciences and Engineering within the Gillings School of Global Public Health at the University of North Carolina–Chapel Hill. For 2017–2018, she also is serving as a University Scholar at RTI International. Dr. Gibson conducts applied and theoretical research to quantify environmental risks to population health in support of environmental policy decisions. Prior to joining the University of North Carolina faculty, Dr. MacDonald Gibson served as Associate Director of the National Research Council's Water Science and Technology Board and as Senior Engineer at the RAND Corporation. Dr. Gibson received a BA (*magna cum laude*) in mathematics from Bryn Mawr College, an MS in environmental science in civil engineering from the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign, a PhD in engineering and public policy from Carnegie Mellon University, and a PhD in civil and environmental engineering from Carnegie Mellon University.